

ABSTRACT

The current invention provides for the manufacture of solar voltaic cells with high sunlight to electricity conversion efficiencies by using improved silver-alloy thin films with a thickness in the range of 30 to 60 as a back reflector/conductor. The back reflector surface may be smooth or roughened depending on the design of the solar voltaic cell and the reflective surface used. Silver-alloy thin film in the thickness range of 3 to 10 nanometers can be used to replace traditional transparent conductor such as indium oxide, indium tin oxide, zinc oxide, tin oxide etc. Elements that can be alloyed with silver to create alloys for use in the invention include, Pd, Cr, Zr, Pt, Au, Cu, Cd, B, In, Zn, Mg, Be, Ni, Ti, Si, Li, Al, Mn, Mo, W, Ga, Ge, Sn, and Sb. These alloys may be present in the silver-alloys in amounts ranging from 0.01 to 10.0 a/o percent. Preferably, elements such as of Cu, In, Zn, Mg, Ni, Ti, Si Al, Mn, Pd, Pt, and Sn are alloyed with silver, these elements are present in the alloy the amounts ranging from 0.05 to 5 a/o percent.